# NEWS RELEASE

Wilfrid Laurier University

## Laurier professor receives prestigious Ontario research award

***Yuming Chen builds mathematical models that could track a flu epidemic***

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WATERLOO – A researcher at Wilfrid Laurier University has received one of the first Early Researcher Award (ERA) grants under a program just announced by the Ontario government.

Yuming Chen, assistant professor with the department of mathematics, is receiving $150,000 to support research into mathematical modelling that incorporates time delays. The research has a number of potential applications in technology and medicine, including the tracking of flu epidemics.

"Dr. Chen is a highly productive researcher and an example of the quality of researchers that the faculty of science has been able to recruit in the past five years," says Arthur Szabo, the dean of science. "At this early stage of his career, Dr. Chen is making an important impact on his field. As well, he is dedicated to being an excellent teacher and to participating in the Laurier community."

Chen's main research interest is in the dynamics of differential equations (or changes to a unique set of variables) that arise from neural networks and population biology, where the future of any equation is influenced by both its current state and its history.

"The goal of the work is to build more realistic mathematical models to make better predictions," says Chen. "The ERA grant will assist in research that could be applied to both medical research and technology in ways that can have profound effects on society."

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Time delays are natural components of biological systems, like a flu epidemic. There is a delay between when a person first contracts the flu virus and when the virus is diagnosed, which often allows the virus to spread without the carrier being aware. Chen's research could be applied to develop a model that incorporates this delay in determining how the flu spreads and how to control it.

"Delays are important for representing resource generation times, maturation periods, feeding times and reaction times for taking account of age structure in the population," says Chen. "A periodic delay could model daily, seasonal or annual fluctuations."

Because Chen's research is based on mathematical models of how the human brain functions, there are other applications to medical research. This includes the development of new algorithms for pre-processing and classifying complex medical images that characterize neurological diseases. Technological applications of Chen's research include new devices for memory storage, pattern recognition and secure encoding.

A PhD graduate of York University, Chen has been a Laurier faculty member for the past five years and has published almost 40 peer-reviewed journal articles. He currently has research funding from the Natural Sciences and Engineering Research Council of Canada totaling $65,000.

Ontario Premier Dalton McGuinty, who also heads the newly created Ministry of Research and Innovation, recently announced that 64 researchers at 13 universities would receive the first ERA grants. Recipients receive $100,000 from the Ontario government and $50,000 from their home institutions.

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